

## PATENT CLAIMS

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1. ~~An illumination unit for point illumination of a me-~~  
dium comprising a plurality of light emitters (3) in the  
5 form of light guides arranged to illuminate an illumina-  
tion face via a light valve arrangement, said light valve  
arrangement comprising a plurality of electrically con-  
trolled light valves, c h a r a c t e r i z e d in that  
at least two of the light emitters (3) are arranged to  
10 illuminate a plurality of light valves (6) each.

2. An illumination unit according to claim 1, c h a r -  
a c t e r i z e d in that it additionally comprises a  
first lens arrangement, said lens arrangement comprising  
15 at least one micro lens arranged with respect to each  
light valve so that the light emitted by the light emit-  
ter or emitters is focused on or in the vicinity of the  
optical axis of the individual light valves.

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3. An illumination unit according to claim 1 ~~or 2~~,  
c h a r a c t e r i z e d in that it additionally com-  
prises a second micro lens arrangement arranged between  
the light valves and the illumination face, so that light  
transmitted through the light channel of the individual  
25 light valve is suitably focused on the illumination face  
(5).

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4. An illumination unit according to <sup>claim 1</sup>~~claims 1-3~~,  
c h a r a c t e r i z e d in that the optical light  
guide or guides (3) are formed by optical fibres, pref-  
erably multimode fibres.

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5. An illumination unit according to <sup>claim 1</sup>~~claims 1-4~~,  
c h a r a c t e r i z e d in that at least one of the  
35 light sources (1) is formed by a short arc gap lamp.

a 6. An illumination unit according to ~~claims 1-5~~, <sup>claim 1</sup>  
c h a r a c t e r i z e d in that the light source com-  
prises a short arc gap lamp (1) having light receiving  
optical light guides or fibres (3) which are arranged  
5 within an angle of  $\pm 75^\circ$  with respect to the equator  
axis of the lamp on a ball face around the lamp, and  
which are optically connected to and conduct light to the  
light emitters.

a 10 7. An illumination unit according to ~~claims 1-6~~, <sup>claim 1</sup>  
c h a r a c t e r i z e d in that at least one of the  
light sources is formed by a laser source.

a 15 8. An illumination unit according to ~~claims 1-7~~, <sup>claim 1</sup>  
c h a r a c t e r i z e d in that it comprises a plural-  
ity of light emitters (3) in the form of light guides,  
each of which is optically connected to a light source  
(1) arranged to illuminate a plurality of light valves  
(6) arranged in a given face shape, at least one collima-  
20 tion lens being arranged between the light emitter and  
the face shape so that collimated light is conducted to a  
first micro lens arrangement associated with the plural-  
ity of light valves.

25 9. An illumination unit according to claim 8, c h a r -  
a c t e r i z e d in that the face shape of the light  
valves forms one or more hexagons.

a 30 10. An illumination unit according to claim 8 ~~or 9~~,  
c h a r a c t e r i z e d in that the individual light  
valves are arranged in rows in the transverse direction  
(9) of the face shape with the light valves at a given  
mutual distance, and that the rows are mutually offset in  
the transverse direction.

a 35 11. An illumination unit according to ~~claims 8-10~~, <sup>claim 8</sup>

characterized in that the rows are arranged such that the projection of all the individual light valves in the transverse direction (9) in the face shape results in a plurality of illumination points at a mutual distance in the transverse direction (9).

claim 1

12. An illumination unit according to ~~claims 1-11~~, characterized in that the face shape or shapes of the light valves are arranged on one or more illumination heads, each illumination head and the illumination face being adapted to perform a relative movement across an illumination area, said device being also provided with a control unit for controlling the light valves in dependence on the relative movement between the illumination head and the illumination face.

claim 1

13. An illumination unit according to ~~claims 1-12~~, characterized in that the illumination head or heads constitute a rod whose relative movement with the illumination face is a single progressing movement in the transverse direction of the rod.

claim 1

14. An illumination unit according to ~~claims 1-13~~, characterized in that the illumination unit between the light valve arrangement and the illumination face additionally comprises optical means for spreading the light beams emitted by the light channels across the illumination face.

claim 1

15. An illumination unit according to ~~claims 1-14~~, characterized in that the light valves of the illumination unit are formed by electrooptically based light valves (spatial light modulators), such as LCD, PDLC, PLZT, FELCD or Kerr cells.

claim 1

16. An illumination unit according to ~~claims 1-15~~,

characterized in that the light valves of the illumination unit are formed by reflection based electromechanical light valves, such as DMD.

a 5 17. An illumination unit according to <sup>claim 1</sup> ~~claims 1-16~~, characterized in that the light valves of the illumination unit are formed by transmission based electromechanical light valves.

a 10 18. An illumination unit according to <sup>claim 1</sup> ~~claims 1-17~~, characterized in that the light guides of the illumination unit are so arranged with respect to the light valve arrangement that the optical energy fed to each subset of light valves does not differ significantly from each other when the subsets of light valves illuminate adjacent areas or areas close to each other on the illumination face.

a 20 19. An illumination unit according to <sup>claim 1</sup> ~~claims 1-5 and claims 7-17~~, characterized in that the light receiving ends of the light guides are gathered in at least one bundle which directly or indirectly receives light from a reflector or a reflector system optically connected to at least one lamp.

25 20. A method of point illumination of a medium by means of a plurality of light emitters (3) in the form of light guides which are arranged to illuminate an illumination face via a light valve arrangement, said light valve arrangement comprising a plurality of electrically controlled light valves, characterized in that at least two of the light emitters (3) are arranged to illuminate a plurality of light valves (6) each.

a 30 21. A method according to claim 20, character-

5 i ~~z~~e d in that the light emitted by the light emitter or emitters is focused on or in the vicinity of the optical axis of the individual light valves via a first lens arrangement, said lens arrangement comprising at least one micro lens arranged with respect to each light valve.

a 22. A method according to claim 20 ~~or 21~~, c h a r a c -  
t e r i z e d in that the light transmitted through the  
light channel of the individual light valve is suitably  
10 focused on the illumination face (5) via a second micro  
lens arrangement arranged between the light valves and  
the illumination face.